

# Pediatric Study: Superior performance of Supero

## Summary

The Supero 412 high-power hearing aid was evaluated in children with severe to profound losses. Results were compared to the children's own high quality hearing aids. Own and test hearing aids were fit and treated equally to ensure an "apples to apples" comparison. Supero showed clear advantages in both speech tests and self-reported benefit. Individual comments from children and parents confirmed the test results.

## Introduction

Hearing impaired children need hearing aids which provide maximum achievable support to them so that they can develop optimal communication skills. This is particularly true for children with severe to profound hearing loss. The performance of the digital high power hearing aid Phonak Supero 412 in pediatric fittings was evaluated in a controlled field trial.

## Method and Design

Ten children, recruited from various public schools in Utah, USA\*, ages 5 to 14 years (mean age: 10.7 years) participated in the study. They were previously diagnosed with bilateral sensorineural hearing loss (ranging from moderate to profound, PTA: 93.4 dB). The children were all previously fitted with hearing aids binaurally. Some had analog aids (2 children), but most had digital ones (8 children). The test hearing aids were Phonak Supero 412,

programmed with Program 1 for quiet listening situations and Program 2 for noisy listening situations.

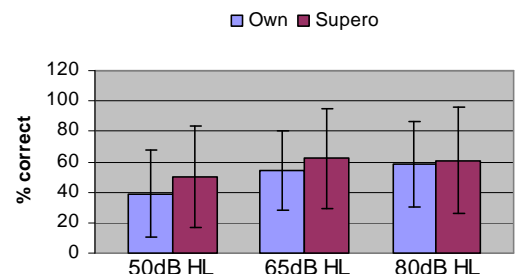
## Same fitting method for own aids and Supero

Both own instruments and Supero were set as closely as possible to each subjects' DSL targets for gain and MPO. Individually measured Real Ear to Coupler Differences (RECD) were included in the pre-calculation.

After fitting the instruments, the subjects had one month period of acclimatization wearing each set of instruments full time. Outcome measures were taken after acclimatization. Thus, own and test instruments were fit and treated equally. This method avoids biased results due to undifferentiated fitting of the subjects' own hearing instruments.

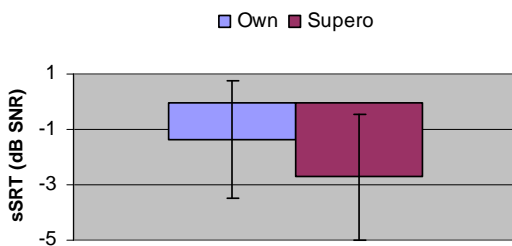
## Results

Speech intelligibility in quiet was measured using the PBK test (List A) at 50, 65, and 80 dB HL. There was an advantage for Supero for soft speech input, and comparable performance for higher input levels.



Speech intelligibility in quiet for different input levels

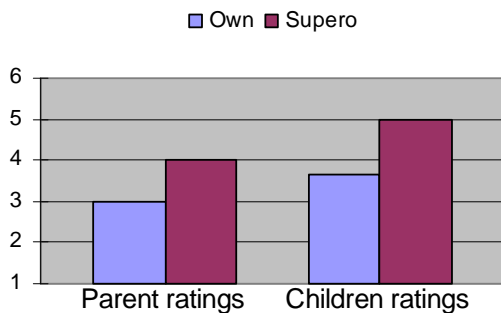
Speech intelligibility in noise was measured using the Pediatric Speech Intelligibility (PSI) test in Format I [1]. Sentences were presented from the front at 60 dB HL. Multi-talker babble was also presented from the front. The noise level varied to adaptively determine the sentence Speech Reception Threshold (sSRT), which indicates the Signal-to-Noise Ratio (SNR) at which 50% of sentences could be correctly repeated [2]. Compared to the own instruments, Supero improved the sSRT by 1.3dB, on average.



Speech in noise results: Supero outperforms own aids (lower values indicate better performance).

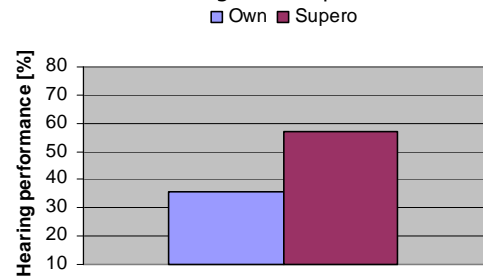
### Clear self-reported improvement

To assess subjective differences, two inventories were administered. The Children's Home Inventory for Listening Difficulties (CHILD) [3] describes a range of every-day listening situations. Speech understanding in these situations was rated by both children and parents. On average, children and parents report better speech understanding with Supero, compared to their own instruments.



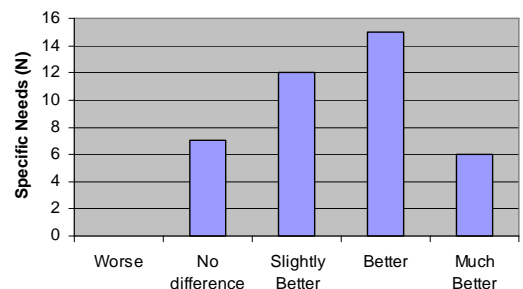
Average CHILD results. Higher numbers indicate better speech understanding

The second inventory was the Client Oriented Scale of Improvement (COSI) [4]. The children each named five individual listening situations in which help with hearing is required (e.g., "understanding speech in mall"). After gathering experience in daily life, the children judged their hearing abilities in these situations. The results show a clear advantage for Supero.



COSI: Average self-reported hearing performance in individual listening situations

The direct comparison between Supero and own aids confirmed these results. In most situations, Supero performed better than the own aids.



COSI: In the individual situation, compared to your own aids, Supero is... (total: N=40).

For more detailed information, please contact [info@phonak.ch](mailto:info@phonak.ch)

### References

- [1] Jerger S, Lewis S, Hawkins J, and Jerger J (1980). International J Pediat Otorhinolaryngol 1980, 2:217-230 .
  - [2] Nilsson M, Soli S, and Sullivan J (1994). Journal of the Acoustical Society of America, 95, 1085-1096 .
  - [3] Anderson KL, maldino JJ (2000). [www.edaud.org](http://www.edaud.org) see also [www.phonak.com](http://www.phonak.com) .
  - [4] Dillon H, James A, and Ginis J. (1997). J Am Acad Audiol 8: 27-43.
- \* The study was conducted by Ronda Condie, MS, Sandy, Utah (USA).